

Sheet problem on airgap & Tooth mmf

A machine has the following dat

Pole arc = ~~0.30~~ ~~m~~ m = 0.3 m

length of machine = 0.36 m

length of airgap = 0.0080 m

Slot pitch at the airgap surface = 0.025 m

Slot pitch at the bottom of slot = 0.022 m

depth of slot = 0.06 m

width of slot = ~~0.06~~ 0.012 m

number of ventilating ducts = 5

width of each ventilating duct = 0.01 m

flux per pole = 7.2×10^{-3} Wb

calculate

(a) the mmf required for air

(b) the mmf required for teeth neglecting the slot flux

(c) the mmf required for teeth considering the slot flux

Ans (a) 4860 A (b) graphical 1122 A

Simpson 1137 ; $B_{\frac{1}{2}}$ 1200

(c) using ~~graphical~~ Simpson 937

B 1.95 2.2 2.25 2.4 2.45

H 200x100 600 800 1600 2000 2100

Sheet on Field coils

1. Design the winding of a 110 V to obtain the greatest number of amperes turns with dissipation of about 6 K. The gross winding space is 0.26×0.22 m. Mean length of turn is 12 m. Assume a space factor of 0.55 and resistivity of copper, when hot, 2×10^{-8} ohm.m.
Ans: 68,600.
2. Determine the copper diameter of the wire of a coil to give 10,000 AT with 120 V across its terminals and a mean length of turn of 0.75 m. Assume resistivity to be 2×10^{-8} ohm.m.
3. A shunt coil has to develop 9000 AT. The voltage drop in the coil is 40, and the resistivity of the round wire used is 2.1 microhms per cm-cube. The winding depth is 0.35 m approximately and the mean length of turns 1.4 m. Design a coil so that the power wasted is 700 per sq meter. ~~The total surface of the coil is to be~~ Take the diameter of the insulated wire to be 0.4 mm greater than the bare wire.